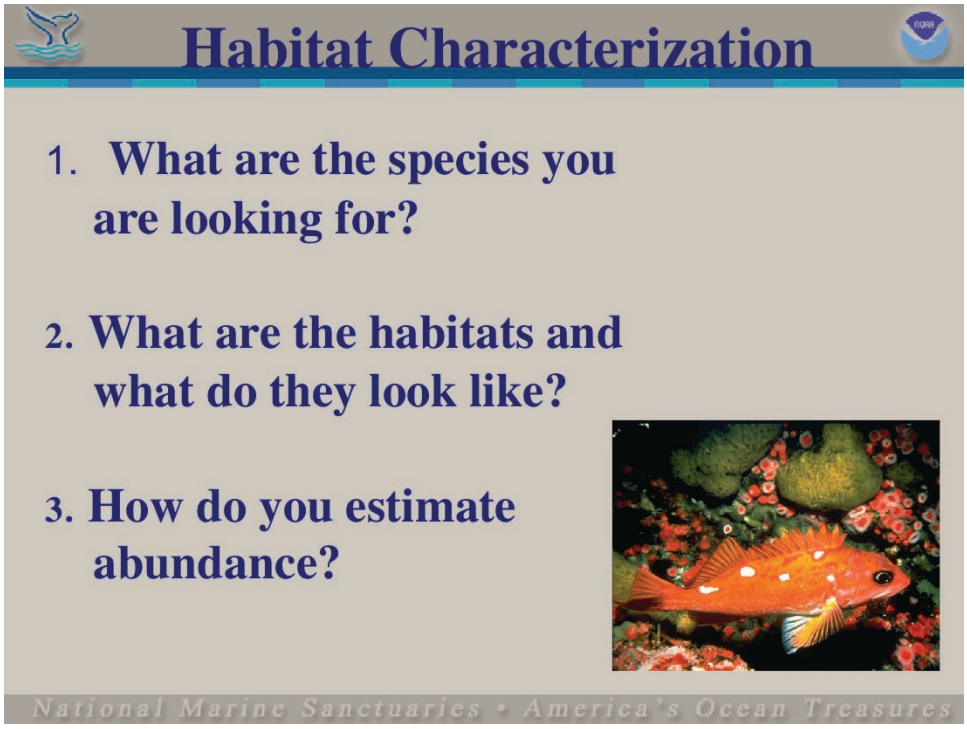
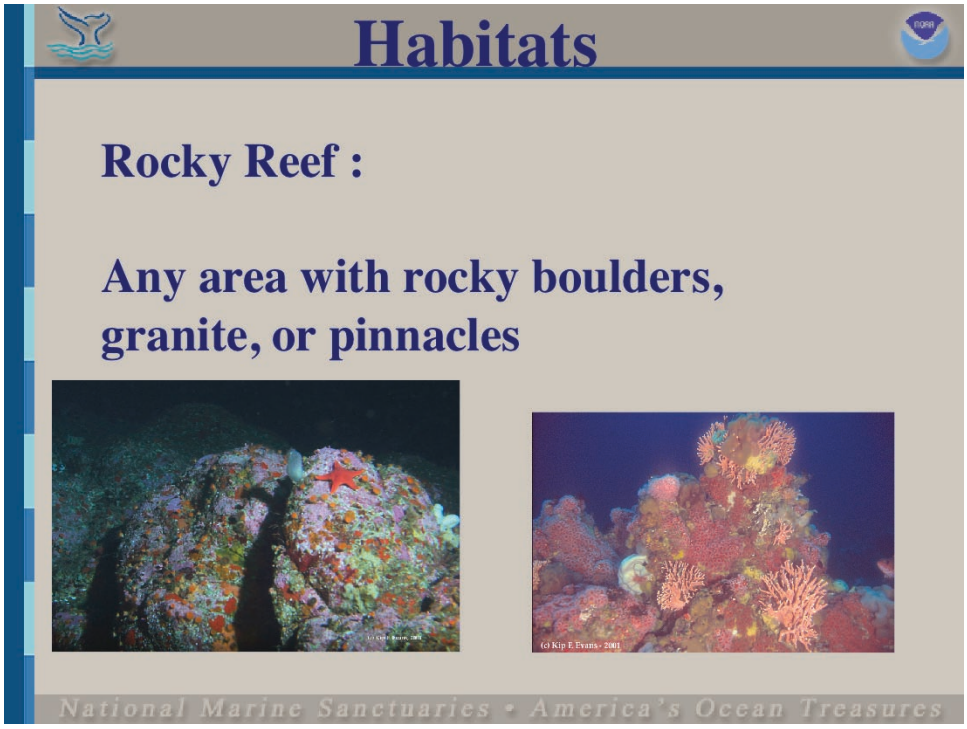
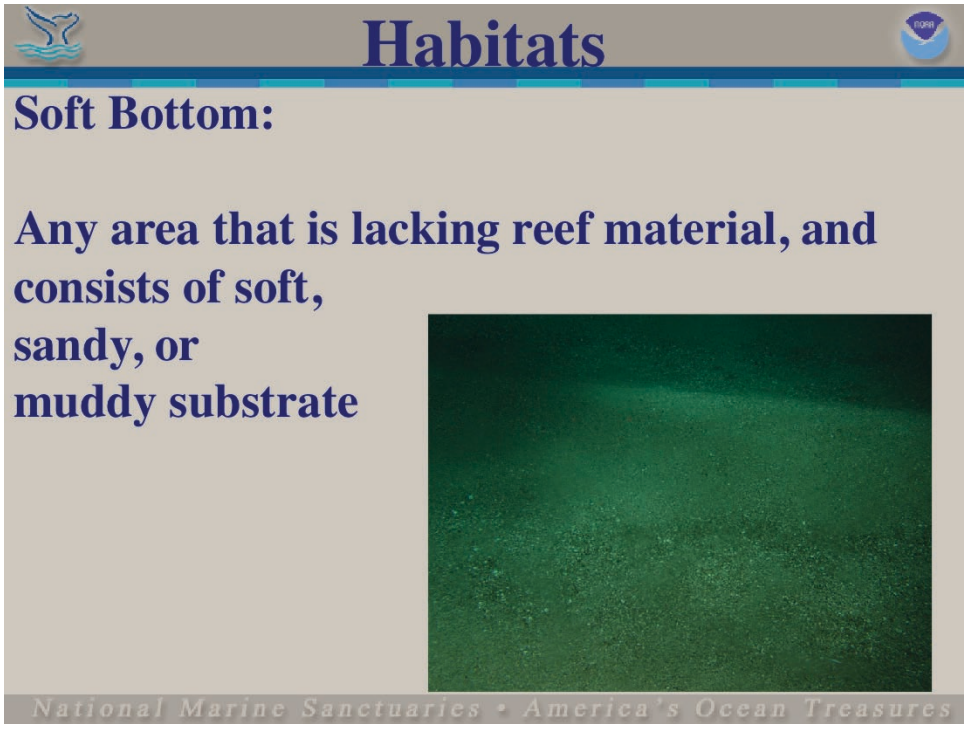
Today we are going to to look at an underwater habitat in one of our National Marine Sanctuaries. National Marine Sanctuaries are sort of like America's National Parks, except they are in the water. These marine protected areas balance long term conservation with compatible uses. Scientists conduct research in the sanctuaries, so managers can make smart decisions about potential impacts or use of these areas. Today, we are going to look at the underwater habitats of Cordell Bank National Marine Sanctuary in California.



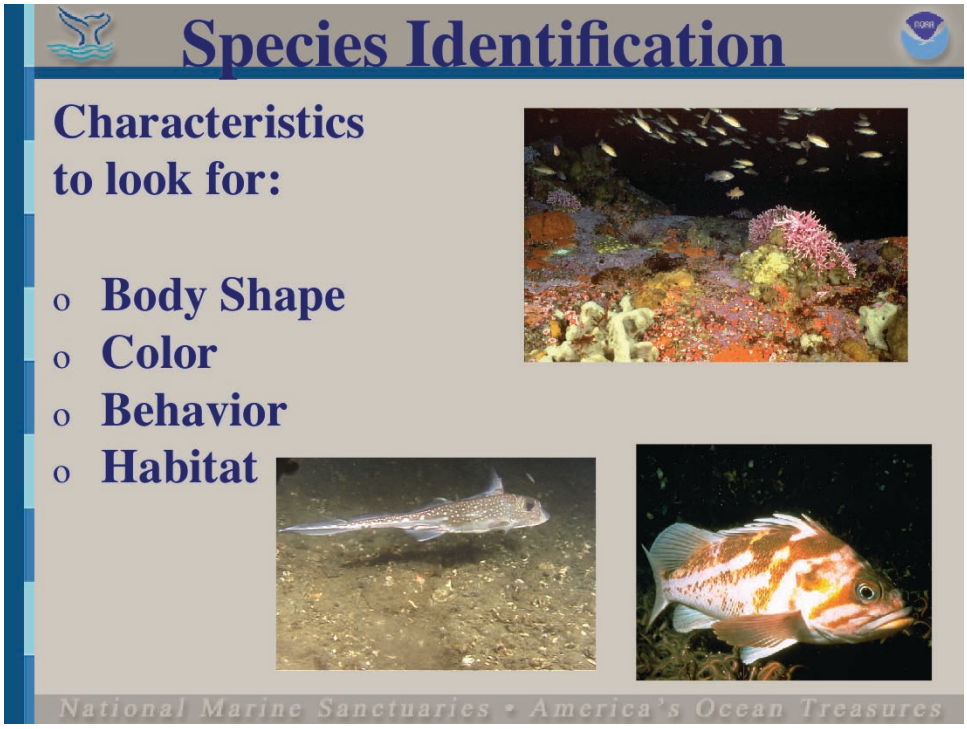
When scientists are learning about a habitat they attempt to describe what species are present, what the habitat is like, and how abundant species may be. Many observers have studied these species for years and are experts in a particular category of animals i.e.: rockfish experts, invertebrate experts. Today you will get acquainted with a few species that are commonly seen in the rocky reef and soft bottom offshore habitats of Cordell Bank National Marine Sanctuary. You will become familiar with identifying characteristics for each species, and learn how to estimate their abundance.



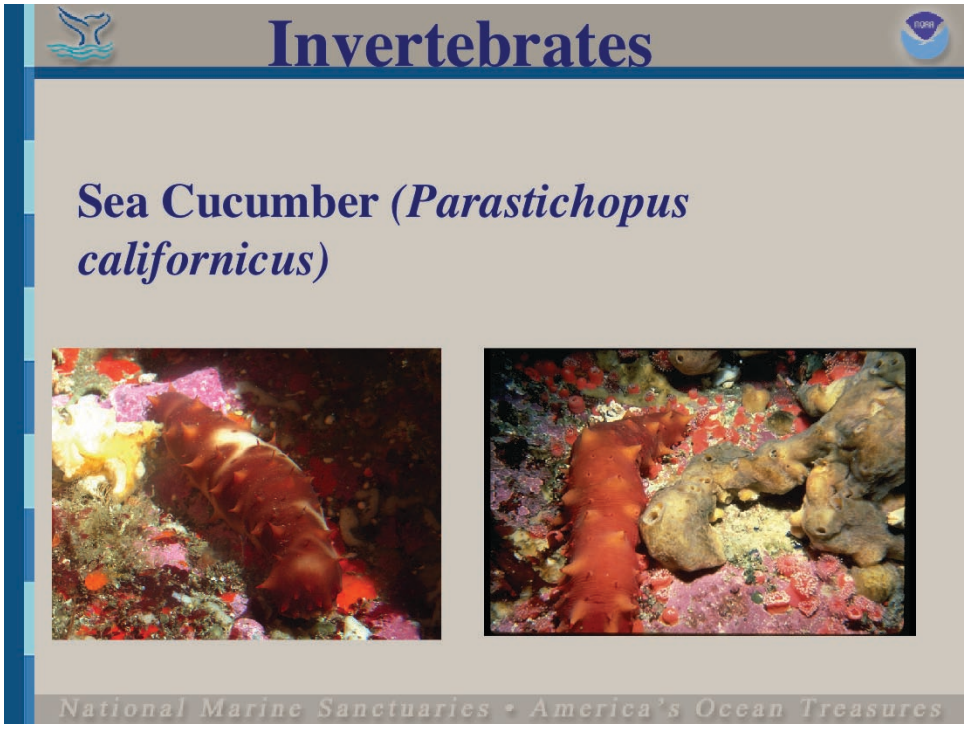
Habitat that is hard in nature is known as rocky reef. Some of these rocky areas look like boulders, some areas are full of cobble like material, and the higher reaches of the Bank are jagged and rough. This habitat provides a place for invertebrates to live. It also provides vital fish habitat. Who knew there were colorful reefs in California?



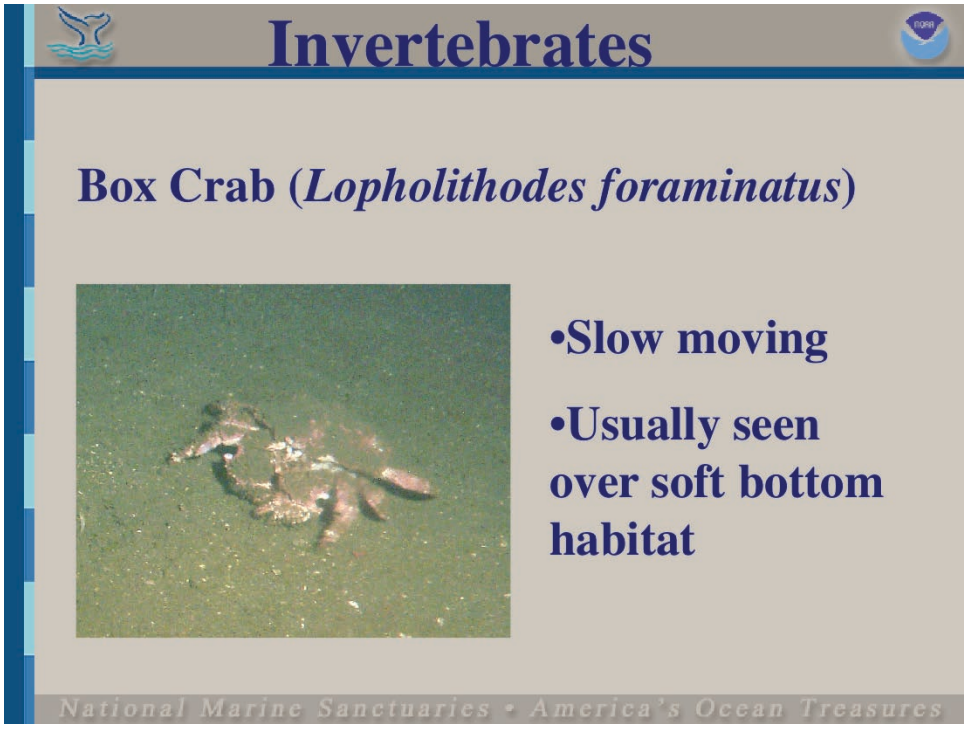
The soft bottom habitat varies from sandy to muddy. The sandy areas are made up of carbonate material (broken up shells and corals) and/or mud. One of the goals of characterizing the benthic/bottom habitats in Cordell Bank National Marine Sanctuary is to see how species use the soft bottom vs. the rocky reef areas and what species are present in each.



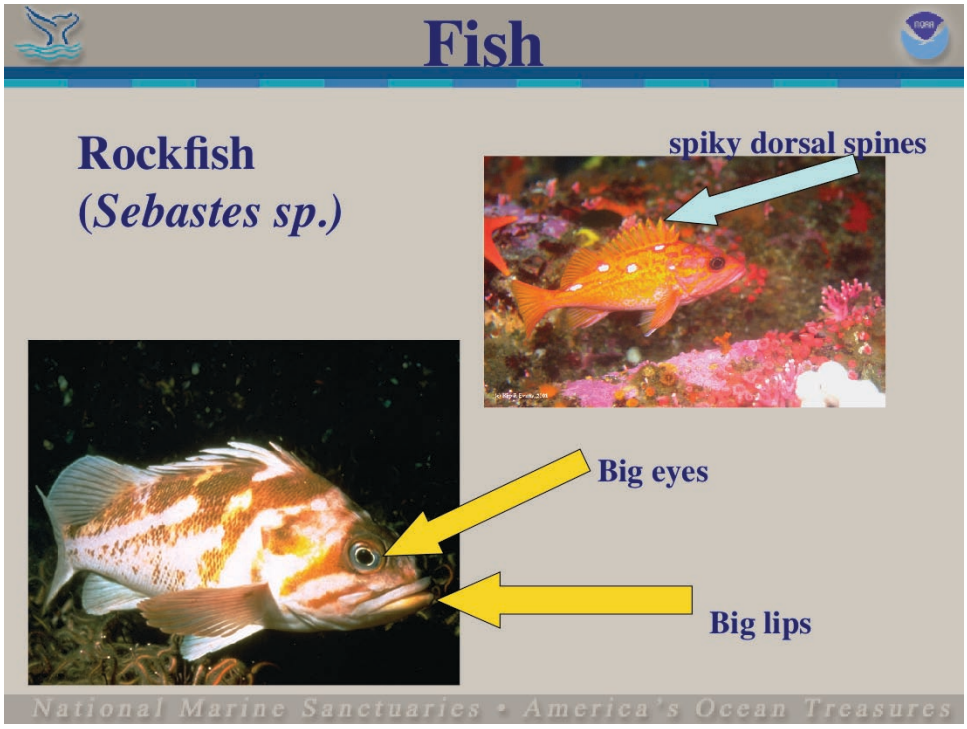
What do you look for when identifying organisms? Characteristics that you should pay attention to are the body shape, the color, its behavior, and the habitat you are reviewing. Some species may be masters of camouflage on the soft bottom, but stick out in the rocky reef areas.



Sea Cucumbers are filter-feeding invertebrates seen in both habitats of the Bank. They only come in one shape, but sometimes are stretched out long and bent in shape. Keep your eyes open on the rocky boulders in the distance for that long "hot dog" shape. They typically are seen individually.

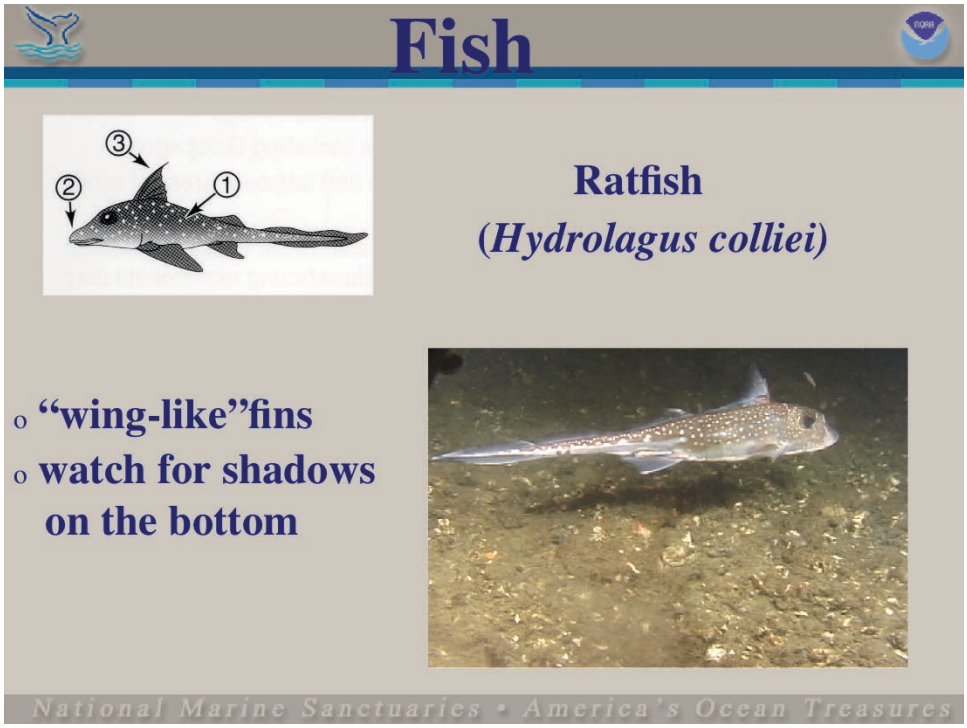


Box Crabs are typically only over the soft bottom, scavenging for food in the soft sediments. They are slow moving and sometimes covered with a little mud, like in this picture.

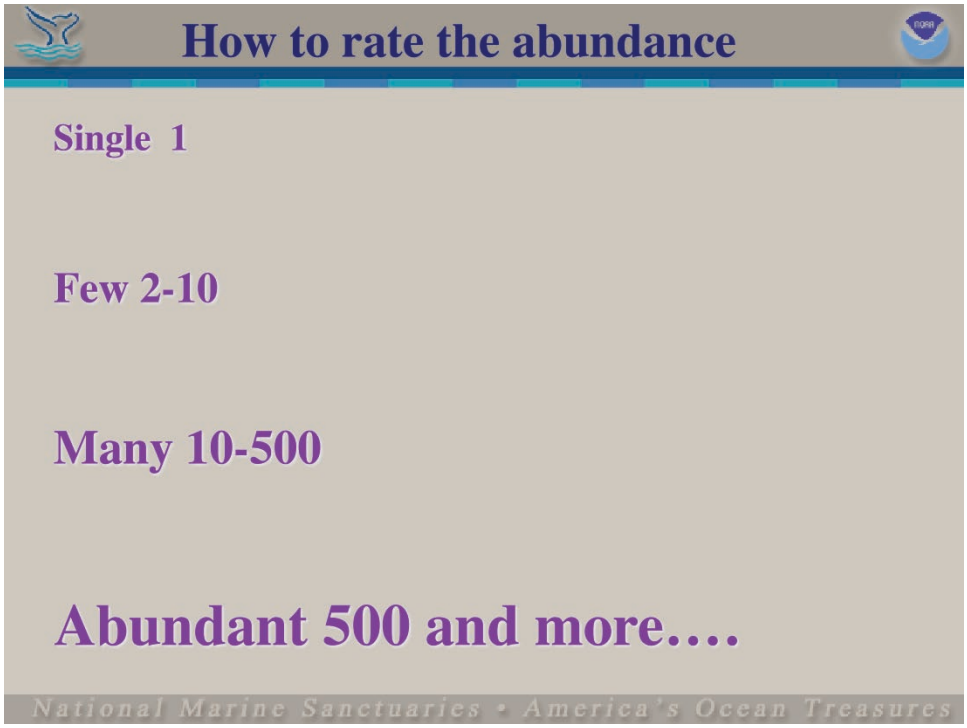


Rockfish are one of the most abundant and diverse species on Cordell Bank, coming in many colors and sizes. The body shape is distinctive. They have a football shaped body, spiny dorsal spines and big eyes and big lips! You may see them over rocky reef and soft bottom habitats in varying size and abundance.

When rockfish are in their juvenile stage they can be seen in massive schools like this. This picture has many more than 500, putting them into the abundant category.

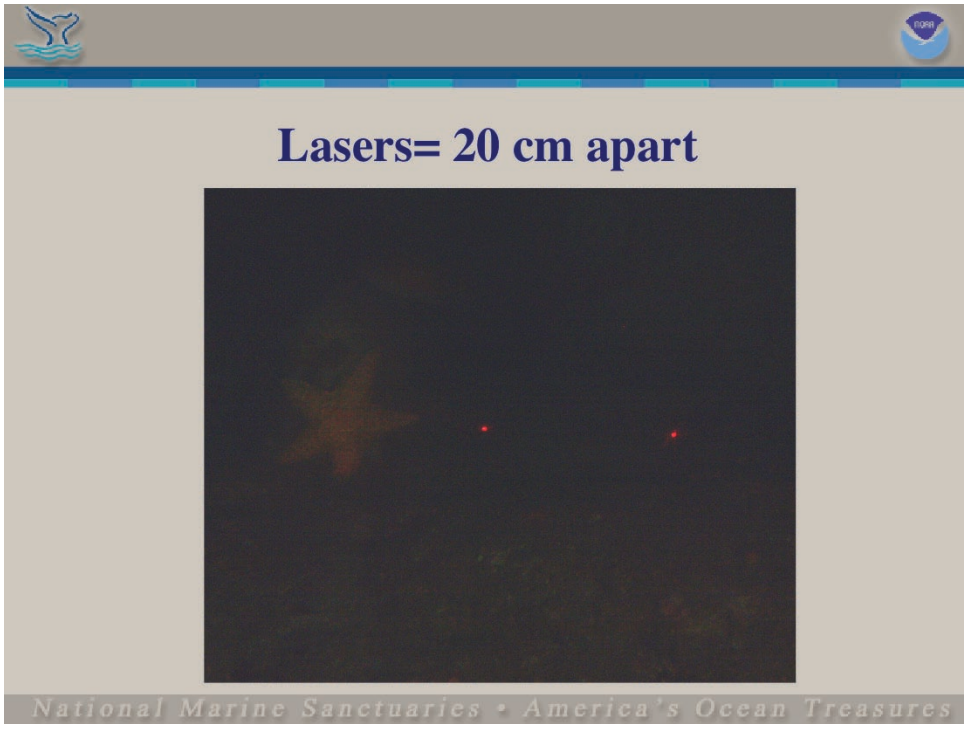


Ratfish are typically a deep-water species, and are completely cartilaginous like sharks are. There are a few ways to identify this fish. They are silvery and use their pectoral fins (on their sides) to maneuver around the habitat. They also have a flattish and pointed nose. In the video footage you may see their pectoral fins cast a distinctive shadow on the bottom.



During the video transect you will be watching for one species. After the transect is complete, you will assign an abundance category for the total amount counted during each minute of the transect. Single is for 1 individual by itself, Few is for 2-10 individuals, Many is for 10-500 and Abundant is for >500. Sometimes species are so abundant that they are hard to count. When species like the rockfish are seen in large schools (greater than 100 or 500) you can mark off "many" or "abundant" on your data sheet immediately.

Look at each of these photos, you can see when its easier to count and when its not.



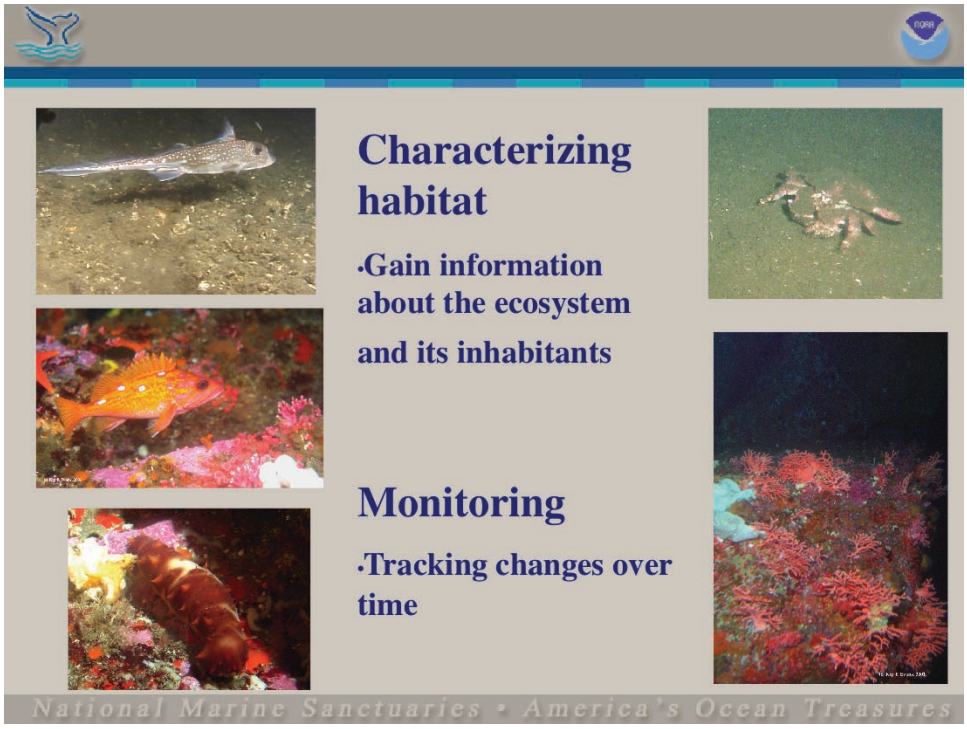
When viewing the video transect, you are going to notice two red dots that don't seem to go away. They are lasers set at a distance of 20 cm apart. These are set to get an accurate measurement of the species you are observing. This is particularly useful for studying rockfish, because it helps us to determine the age class of a fish.

Sometimes the video footage moves too fast to really see details of species, try to make out the overall shape and identifying features. Can you tell what this is?

This is a rockfish, actually two. How can you tell?

You should be able to make out what this species is even though the picture is really blurry. (It's a cucumber)

Even in the dark, if you can make out the shapes of these animals. The top photos are a box crab, bottom left is a rockfish (see the spiky dorsal fin), and the bottom right is a ratfish.



Once we are able to identify the species in the habitats and how they are using them, we start to get a picture of what lives there. Once we gain this information we can then monitor year to year to track changes in the habitat over time.

Marine Protected Areas, like National Marine Sanctuaries are responsible for safeguarding these special areas for the future. Research provides information and data to best prepare for potential impacts. Potential impacts to a seafloor habitat could be cable laying, alternative energy like wave/wind generators, some types of fishing practices, observation equipment and more. Having more information about the habitats will help us to better protet them to function as they should in the marine ecosystem.